The Perception of Research Quality Based on Institutional Esteem

Senior Research Thesis

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by

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Abstract

The present study examined whether institutional esteem contributes to how readers were persuaded by presented research information. It was hypothesized that the prestigious reputation of an institution may cause readers to process the presented information less thoroughly, and that they would use the institution as a heuristic cue when forming an attitude towards the presented topic. In Study 1, 267 participants on Amazon's MTurk read an argument in favor of junk food taxation that varied based on the esteem (high, low) of the institution that conducted the research and on the strength of the argument (strong, weak). Results indicated a main effect of argument strength, such that individuals who read strong arguments had more favorable attitudes toward junk food taxation than those who read weak arguments; however, there was no main effect of institutional esteem on junk food taxation attitudes. In Study 2, 213 introductory psychology students followed the same protocol as Study 1 with an additional manipulation of cognitive load (high, low, none) while reading the junk food taxation argument. Results of Study 2 indicated no effect of institutional esteem, argument strength, or cognitive load on attitudes toward junk food taxation. Implications for the understanding of how institutional esteem may affects attitudes are discussed.

Researchers suggest that many individuals tend to be "cognitive misers" (Moss & DiCaccavo, 2005), meaning that they are likely to not think about things more than they have to. Because individuals tend do not process all of the information that is presented to them throughout the day, they tend to rely on heuristics to make decisions and form attitudes towards a topic. Heuristics can be described as easily applied decision making techniques that are based on prior experiences, but do not always use all available information to the individual making the decision (Katsikopoulos, 2011). For example, one study found that when given a choice of two products, individuals often chose the familiar product –even when provided with additional information suggesting it was of lower quality (Thoma & Williams, 2013). The results of this study indicate that individuals may use mental shortcuts (heuristics) to aid perception of product quality.

In a similar way, individuals may use the esteem of an institution as a heuristic when making decisions regarding the research that comes from the institution. For example, a study conducted in England found that the more prestigious institutions benefited from a publication bias, and that there may have been a kind of "halo effect" that made their research appear to be of higher quality (Taylor, 2011). The present study aimed to examine whether the strength of an argument might be overlooked if the person reading it was processing the information peripherally. Specifically, if the individual is processing peripherally, would they overlook a weak argument and rely on the esteem of the institution from which the argument came to form their attitude towards the topic of the argument?

Information Processing – The Elaboration Likelihood Model

To assess how closely the participants were processing information that was presented to them in an argument, the present study took an information processing approach. Several dual

process models of information processing exist and provide frameworks for understanding the manner in which people process information, forms of influence, and the persuasion process (Cacioppo & Petty, 1984; Chaiken & Eagly1989). One dual process model is the Elaboration Likelihood Model (ELM; Cacioppo & Petty, 1984). According to the ELM, there are two routes through which attitude change can occur: the central route and the peripheral route (Petty & Cacioppo, 1986). The central route of processing information requires cognitive effort; processing in such a way leads to an individual attending to information contained in an argument in an elaborative way that taxes an individual's cognitive resources. Processing information in this way helps an individual come to an informed opinion, or a well-founded attitude, on a topic. Also, the attitude will likely be long-lasting and resistant to change (Cacioppo, Petty, Kao, & Rodriguez, 1986). Individuals are likely to take the central route when they are motivated and able to attend to information presented in an argument (Cacioppo & Petty, 1984). However, if the individual is unwilling or unable to elaborate on the presented information, then they are more likely to take the peripheral route, relying more on peripheral cues (such as authority of the source of the argument or the length of the argument) within the information and heuristics in information processing and decision making (Cacioppo et al., 1986). The peripheral route of processing is a way of information processing in which individuals are more likely to use shortcuts, such as heuristics, to form opinions and come to conclusions. Such processing leads an individual to an opinion or attitude on a topic that is transient and susceptible to future persuasion. As previously stated, it is possible that the esteem of an institution named in an argument may serve as a peripheral cue to an individual that is not processing centrally. The esteem of the institution, not the argument itself, may serve as a heuristic that is the basis of the individual's formed attitude.

Many studies have found different scenarios in which one route of processing may occur over the other, in turn affecting how likely individuals were to rely on heuristics. For example, one study utilizing the ELM to examine the effects of consumer skepticism found that highly skeptical consumers were more likely to rely on their intrinsic beliefs instead of situational factors – taking the more central route to processing when shopping online – whereas consumers with low skepticism were more likely to take the peripheral route – relying on peripheral cues such as review quality when forming an attitude toward a product (Sher & Lee, 2009). It is possible an argument from a highly esteemed institution may result in someone being less skeptical of the argument itself, and that preconceived notions of where information is coming from could affect attitudes toward more than just consumable goods. One study conducted to evaluate the effectiveness of Research Assessment Exercise panels–panels tasked with evaluating the quality of research being produced by British higher education institutions–found that they tended to be biased toward more prestigious institutions (Taylor, 2011). Although the study did not evaluate whether or not the review panels were processing in a peripheral fashion, it is possible that peripheral processing could serve as a proxy for such a bias. By controlling the processing route taken by participants, it may be possible to manipulate the frequency with which they use heuristic cues–such as the name of the sponsoring institution–to evaluate research or argument quality. It is expected that use of the peripheral route will result in an increase of the use of such heuristics.

There are situations in which heuristics can be used reliably to make quick decisions. For example, heuristics are commonly used in situations in which there may be little information about a topic, a non-linear decision environment, or when the cognitive abilities of the decision maker are taxed (Katsikopoulos, 2011). However, some researchers suggest that without

adequate experience to draw from, subjects tend to rely more heavily on heuristics that may bias perceptions (Ganzach, 2009). In other words, previous knowledge and preconceived beliefs can form future beliefs and guide future decisions, and those beliefs and decisions are not always best adapted to the situation in which they are being applied. One study found that with depleted cognitive resources (restriction of the letters that participants were allowed to respond with), participants were more likely to use a recognition heuristic when asked to determine which of two presented cities had a larger population (Pohl, Erdfelder, Hilbig, Liebke, & Stahlberg, 2013). The results of this study indicate that individuals are more likely to use heuristics when they have limited cognitive resources. Applied to the current study, when the cognitive resources of an individual are depleted, it is more likely that the individual will use the institution's name, or their perception of the institution's esteem, as a heuristic for judging the persuasive quality of an argument.

Although people are motivated to hold correct attitudes, there a number of reasons that the peripheral route might be taken instead of the central route, resulting in less elaboration and an increased chance of holding an incorrect attitude towards a topic or issue (Cacioppo & Petty, 1984). Situations that may result in an individual taking the peripheral route could include, but are not limited to, little time allotted for processing, low issue relevance (the participant does not feel that the persuasive message is impactful on a personal level), and low cognitive capacity (Cacioppo & Petty, 1984).

It is possible that these differences in information processing affect decision making based on persuasive messages in different situations. One study asked participants to look at a fabricated page of job advertisements and pick the six that they would most likely apply to (Jones, Shultz, & Chapman, 2006). Those who were more motivated (given a cash incentive) and

capable of elaboration (more time allowed to read all ads) tended to select advertisements that had relevant information about the job (e.g., paying higher wages, being in a field of interest). Conversely, those who were not told that there would be a cash incentive and/or were not allowed enough time to read each advertisement were more likely to take the peripheral route, relying on peripheral cues pertaining, for example, to how attractive the advertisement looked (Jones et al., 2006). The results of these studies suggest that experimenters can create situations in which participants are more likely to take a particular processing route to persuasion. The present study aims to employ the same type of manipulations, making it more likely that participants will process information peripherally leading to the use of institutional esteem as a peripheral cue.

Argument Strength

Argument strength has been used as another means of producing attitude change. A strong argument can be defined as one containing statements that, when participants are instructed to think about them, they tend to result in favorable attitudes towards the topic. However, a weak argument would be one containing statements that when participants are instructed to think about them, they tend to result in thoughts and attitudes that are unfavorable towards the topic (Petty & Cacioppo, 1986). One previous study used argument quality to manipulate the formation of attitudes toward information technologies (IT), finding that stronger arguments resulted in more positive attitudes toward the use of IT (Lee, 2012). Another study found that when participants read an argument for junk food taxation that was counter to their attitudes, stronger arguments led to more favorable attitudes toward the topic (Clark, Wegener, & Fabrigar, 2008). By manipulating argument strength, the present study seeks to assess whether institutional esteem affects the way in which participants process information. Specifically, if

institutional esteem is high, participants may use the esteem of the institution named in the argument as a way of quickly forming their attitude regardless of the argument strength. It is likely that this peripheral cue would be trumped by argument strength if the information is processed centrally. If participants process the arguments in the current study peripherally, argument strength should not matter. That is, when the participants are processing peripherally they should have more positive attitudes when they read an argument from a high esteem institution than a low esteem institution. However, if participants instead process the arguments centrally, the strength of the argument should relate to the magnitude of attitudes.

Institutional Esteem and Implicit Biases

Implicit biases are biases that are unintended: something a person is unaware of holding, but by which they are still affected (Cooley, Payne, & Phillips, 2014). For example, one study utilizing the implicit association test (IAT; a measure of implicit bias) found that undergraduate students majoring in nursing and psychology expressed an implicit bias towards overweight individuals (Waller, Lampman & Lupfer-Johnson, 2012). The students in the study had trouble associating positive attributes to images of overweight individuals, and they also had difficulties ascribing negative attributes to images of normal-weight individuals. A similar study found an unconscious bias against race and gender when evaluating letters of recommendation (Morgan, Elder, & King, 2013). Specifically, individuals with African American sounding names were rated significantly less likely to achieve overall success in the graduate program of the participant's field than individuals with Caucasian sounding names, and female applicants were rated significantly higher than male applicants (after controlling for the effects of race). It is likely that students in these studies were making decisions guided by implicit biases based on weight (Waller et al., 2012) and race and gender (Morgan et al., 2013). A previous meta-analysis

indicated that when less information is provided regarding applicant characteristics, male applicants were rated more favorably than female applicants (Swim, Borgida, & Maruyama, 1989). In a recent study, when science faculty at Yale University were presented with applications for a lab manager position, they were more likely to choose male students for the job, even though the applications from the male and female students were identical except for the applicant's name (Dovidio, Moss-Racusin, Brescoll, Graham, & Handelsman, 2012). Although individuals in academia may be highly educated and aware of their decisions and mindsets, they are not impervious to implicit biases. If this bias can occur in academia, it is also likely that such an implicit bias could develop in the general public, in turn affecting attitude formation.

Evidence for a bias in the perception of academic research quality exists (Taylor, 2011). It is reasonable to think that individuals who are at all familiar with an academic institution will have a formed opinion of it. These opinions may be shaped by common beliefs and views in today's cultures, beliefs that may lead individuals to see research and findings from institutions that they view to be more prestigious as infallible. Conversely, they may also view institutions that they perceive as less prestigious, as being less trustworthy, in turn biasing their perception of research coming from such institutions as less trustworthy and persuasive.

Although not directly related to institutional esteem, a recent study examined participants' ability to detect erroneous information in a research summary. Eriksson (2012) asked participants to read one of two abstracts, one from anthropology and one from sociology, in which the abstract was presented as-published (no manipulation) or with the addition of both an erroneous sentence and a "nonsense" mathematical equation. Results indicated that participants rated the abstracts containing the mathematical equation as of higher quality than those without the equation, even though this equation made no sense given the rest of the

abstract. The results of this study also point towards the potential for individuals to "miss" information that could show flaws in a research study; however, it is unclear if they were processing the information in this study centrally or peripherally.

The Present Studies

The present studies sought to ascertain whether or not institutional esteem has an effect on the formation of attitudes towards a topic. It is possible that institutional esteem plays differing roles in attitude formation based on whether the evaluator is processing through the peripheral or central route. In the first study, argument strength and institutional esteem were manipulated to assess their influences on attitude formation. In the second study, cognitive load was also manipulated to assess whether this factor altered processing route. For Study 1, it was hypothesized that institutional esteem will play a role in the formation of the participants' attitudes towards junk food taxation. Specifically, high esteem institutions will result in more positive attitudes towards junk food taxation than low esteem institutions. It was also hypothesized that those who read a strong argument in favor of junk food taxation will have more positive post-manipulation attitudes towards junk food taxation than those who read a weak argument. It was hypothesized that there would be an interaction effect. Specifically, it was hypothesized that when an argument is weak, high esteem institutions will result in more positive attitudes towards junk food taxation than low esteem institutions. However, there would be no difference in attitudes between the strong argument/high esteem and strong argument/ low esteem conditions. However, for strong arguments there will be no differences between high and low esteem institutions.

For Study 2, a manipulation of cognitive load was introduced to lead participants towards processing the argument centrally (no cognitive load) or peripherally (low/high cognitive load).

For Study 2, it was hypothesized that institutional esteem will play a role in the formation of the participants' attitudes towards junk food taxation. Specifically, high esteem institutions will result in more positive attitudes towards junk food taxation than low esteem institutions. It was also hypothesized that those who read a strong argument in favor of junk food taxation will have more positive post-manipulation attitudes towards junk food taxation than those who read a weak argument. It was also hypothesized that there would be no main effect of cognitive load on participants' attitudes towards junk food taxation. Specifically, participants' attitudes towards junk food taxation would not differ between the no cognitive load, low cognitive load, and high cognitive load conditions. The lack of a predicted main effect is due to the effect being qualified by higher order interactions.

It was also hypothesized that there would be a few interaction effects. Specifically, when assessing the interaction between argument strength and institutional esteem, it was hypothesized that when an argument is weak, high esteem institutions will result in more positive attitudes towards junk food taxation than low esteem institutions. However, there would be no difference in attitudes between high and low institutions when the argument is strong. However, for strong arguments there will be no differences between high and low esteem institutions. Also, it was hypothesized that when an argument is weak, participants under no cognitive load will have attitudes towards junk food taxation that are more negative than those under a low or high cognitive load. Also, participants under a low cognitive load will have attitudes towards junk food taxation that are more negative than participants under a high cognitive load. However, when the argument is strong there will be no effect of cognitive load. It was also hypothesized that there would be an interaction effect between cognitive load and institutional esteem. Specifically, when participants are reading an argument from a high esteem institution, high

cognitive loads will result in attitudes that are more positive than low cognitive loads, and low cognitive loads will result in attitudes that are more positive than no cognitive load. However, it was hypothesized that there would be no differences in attitudes between participants who read arguments from low esteem institutions in the no cognitive load condition, low cognitive load condition, and high cognitive load conditions.

It was also hypothesized that there would be a three way interaction effect. Specifically, when participants reads an argument from a high esteem institution, and they have a strong argument, there will not be significant differences in attitudes between those who were in the no cognitive load condition, low cognitive load condition, or high cognitive load condition. However, when participants read an argument from a high esteem institution, and they have a weak argument, those under no cognitive load will have attitudes towards junk food taxation that are more negative than those who were under a low cognitive load, and that those under a low cognitive load will have attitudes that are more negative than those who were under a high cognitive load. Also, when participants read an argument from a low esteem institution, and they have a strong argument, there will not be significant differences in attitudes between those who were in the no cognitive load condition, low cognitive load condition, or high cognitive load condition. However, when participants read an argument from a low esteem institution, and they have a weak argument, those under no cognitive load will have attitudes towards junk food taxation that are more negative than those who were under a low cognitive load, and that those under a low cognitive load will have attitudes that are more negative than those who were under a high cognitive load. However, the attitudes of by participants who read weak arguments from high esteem institutions will be more positive than the attitudes of those who read weak arguments from low esteem institutions across all cognitive load conditions.

Study 1 Method

Participants

Participants were 292 workers (83 males; 76.2% Caucasian; M_{age} = 39.18, SD_{age} = 12.88) on Amazon's Mechanical Turk (MTurk) who each received $0.25 for participating in the study. A description of the present study was posted on Amazon's MTurk website where potential participants were able to click a link to participate in the study. Participants were assigned a random ID number so that no personal or identifying information was linked to their individual responses.**Procedure and Measures**

All study procedures were approved by the University's Institutional Review Board. Participants first provided informed consent. All measures were completed on a computer by online workers for MTurk. Participants first completed the study-specific measure of attitudes toward ten contemporary issues. This study-specific 10-item measure of pre-manipulation attitudes (Appendix A) asks participants to rate their attitudes towards contemporary issues (such as junk food taxation, marriage equality, and marijuana legalization), using a scale of 1 (*completely opposed*) to 5 (*completely for*). This measure was used to determine participants' pre-manipulation attitude toward junk food taxation, the item of interest, while not revealing to the participants that this was what was being measured.

Participants were then randomly assigned to one of the study conditions based on the following variables: institution esteem and argument. Institution esteem was manipulated in one of two ways: High (one of the top five ranked U.S. universities on the 2014 US News and World Report rankings: Columbia University, Harvard University, Princeton University, Stanford University, Yale University) or Low (one of the bottom five ranked U.S. universities: Montana State University, South Dakota State University, University of Montana, University of Missouri

at Kansas City, University of North Carolina at Charlotte). Participants were prompted that they would be reading an argument in favor of junk food taxation from one of these ten institutions (each participant saw their randomly assigned institution name). The argument for junk food taxation was adapted from a previous study (Clark et al., 2008). Argument quality was manipulated in one of two ways: Strong (e.g., research summary from a university researcher, diabetes statistics, weak framing of statistics) or Weak (e.g., research summary from a university research assistant, joint pain statistics, weak framing of statistics). Please see Appendix B for the manipulated versions of the argument.

Following the manipulation, participants were asked to rate their attitudes towards junk food taxation (Appendix C). Participants were asked to rate how they perceived junk food taxation on scales of 1 (*negative, harmful, foolish, undesirable, bad, favorable, unneeded, not valuable, possible, not affected*) to 9 (*positive, beneficial, wise, desirable, good, unfavorable, needed, valuable, possible, affected*) based in part on previous research (Clark et al., 2008). We then assessed attitude certainty by asking participants on a scale of 1 (*not at all certain*) to 7 (*very certain*) the following questions: 1) How certain are you that your attitude is correct?; and 2) How certain are you in your attitude towards the new policy? Participants were also asked to write down up to 10 thoughts that they had while reading the junk food taxation argument (responses not analyzed in the present study).

Participants then completed a study-specific measure of institutional esteem (Appendix D). Participants were asked to rate how prestigious they believed the 10 institutions used in the present study were using a scale of 1 (*not at all prestigious*) to 5 (*very prestigious*). Internal consistency was high for the high (α = .85) and low (α = .92) esteemed institutions. This scale was incorporated as a means of checking the manipulation of institutional esteem. It was used to

determine whether or not the participants were distinguishing between the esteem of the two groups (High and Low).

A final manipulation check was used to evaluate the memory of the participants (Appendix E). The participants were prompted to write down everything thing that they could remember from the argument for junk food taxation. They were then asked to freely recall the name of the institution from which the argument was said to have come from. Lastly, they were asked to rate the esteem of the institution in the argument.

At the end of the study, participants were asked to report basic demographic information. They were then debriefed and received the study incentive.

Data Analysis

First, the data were examined to assess for any participants who did not likely attend to the study manipulation. Any participant for whom open-ended responses (thought listings, argument summary, institution name recall) were not related to the task (for example, blank spaces, random sequences of letters) was culled from further analysis. A total of 25 participants were removed from further analysis for this reason. Next, total participation times were calculated for each participant, and all participants completing the study within three standard deviations of the mean. The remaining analyses were conducted on 267 participants (81 males, 76.3% Caucasian, ages 18-73 [M = 39.40, SD = 12.92]). To examine the study hypotheses, I conducted a series of 2 (Institutional Esteem: high vs. low) x 2 (Argument Strength: strong vs. weak) ANOVAs on the dependent variables.

Results

First, a 2 x 2 ANOVA was conducted to determine if there were any pre-manipulation group differences in attitude toward junk food taxation. There was not a significant difference in

pre-manipulation attitudes by institutional esteem, $F(1,263) = 1.32$, $p = .25$, or by argument type, $F(1,263) = 1.88$, $p = .17$. The interaction was also not significant, $F(1,263) = 1.42$, $p = .24$. Means and standard deviations for the study variables are presented in Table 1.

Next, a series of 2 x 2 ANOVAs were conducted to compare the effect of institution esteem and argument strength on post-manipulation attitudes toward junk food taxation. Of note, the ten post-manipulation attitudes items were averaged into three composite scores based on previous research with these items and results of scale reliability analyses: Items 1-5 (Clark et al., 2008), Item 6 ("Junk food taxation is unfavorable/favorable"), and Items 7-10. For clarity, Items 1-5 will be referred to as the Clark et al. Scale, and Items 7-10 will be referred to as the Junk Food Affect Scale. Internal consistency was high for the first five items ($\alpha = .98$). For the second five items, internal consistency was adequate when Item 6 (*favorable/unfavorable*) was removed from the analysis ($\alpha = .69$).

For Items 1-5, the main effect of institutional esteem was not significant, $F(1,263) = 0.16$, $p = .69$, $\eta^2 = .001$. However, there was a significant main effect of argument type, $F(1,263) = 8.45$, $p = .004$, $\eta^2 = .03$, indicating that strong arguments ($M = 7.38$, $SD = 3.17$) resulted in more positive attitudes towards junk food taxation compared to weak arguments ($M = 6.16$, $SD = 3.38$), independent of institutional esteem. There was not a significant institutional esteem by argument type interaction, $F(1,263) = 2.63$, $p = .11$, $\eta^2 = .01$.

When the participants were asked to rate how much they favor junk food taxation, there were no significant main effects of institutional esteem ($F(1,263) = 0.05$, $p = .83$, $\eta^2 = .00$) or argument type ($F(1,263) = 3.39$, $p = .07$, $\eta^2 = .01$), or significant interactions between the two factors, $F(1,263) = 1.16$, $p = .28$, $\eta^2 = .004$)..

Lastly, for Items 7-10, neither the main effect of institutional esteem, $F(1,263) = 0.23$, $p = .63$, $\eta^2 = .001$, nor the main effect of argument type, $F(1,263) = 1.23$, $p = .27$, $\eta^2 = .01$, were significant. The interaction effect was marginal, $F(1,263) = 3.50$, $p = .06$, $\eta^2 = .01$. For those participants reading an argument from a highly esteemed institution, more positive attitudes towards junk food taxation were seen following a strong ($M = 5.52$, $SD = 1.94$) rather than weak ($M = 4.79$, $SD = 2.03$) argument, $p = .03$. No significant differences emerged for those in the low esteem condition ($p = .61$).

When participants were asked to rate how certain they were that their attitudes toward junk food taxation were correct ("How certain are you that your attitude is correct?"), there were no significant main effects of institutional esteem: $F(1,263) = 0.15$, $p = .70$, $\eta^2 = .001$; argument type: $F(1,263) = 0.09$, $p = .76$, $\eta^2 = .00$ or significant interactions between the two factors, $F(1,263) = 0.25$, $p = .62$, $\eta^2 = .001$. There were similarly no significant differences when participants were asked to rate how certain they were in their attitudes toward junk food taxation ("How certain are you in your attitude towards the new policy?"; ps > .30).

Secondary Analyses

Participants were also asked to freely recall the name of the institution the research in the junk food taxation argument came from. A 2 (argument strength) × 2 (institutional esteem) ANOVA was conducted on if participants remembered the correct institution (coded 0 = incorrect and 1 = correct). There was not a significant main effect of institutional esteem, $F(1,263) = 2.47$, $p = .12$, $\eta^2 = .01$, or argument type, $F(1,263) = 0.00$, $p = .97$, $\eta^2 = .00$, on correct recall of the institution. The interaction was also not significant, $F(1,263) = 0.43$, $p = .51$, $\eta^2 = .00$. Of those who remembered the correct institution (83/267), however, there was a significant main effect of institutional esteem, $F(1,79) = 36.83$, $p < .001$, $\eta^2 = .32$, but not of argument type

(p = .12) or significant interaction (p = .44), on ratings of the esteem of the manipulation institution. Specifically, participants rated the esteem of the correctly remembered institution as higher in the High esteem group (M = 4.43, SD = 0.61) than in the Low esteem group (M = 3.25, SD = 1.11).

Several significant findings emerged on the institutional esteem scale. All participants were asked to rate the esteem of all five High esteem institutions and all five Low esteem institutions that were used in the present study. The following analyses were conducted on participants' ratings of the High versus Low esteem institutions on the institutional esteem scale. For the High esteem institutions (Columbia, Harvard, Princeton, Stanford, Yale), there was a significant institutional esteem by argument type interaction, $F(1,244) = 5.39$, $p = .02$, $\eta^2 = .02$; however, none of the pairwise comparisons were statistically significant ($ps > .07$). For the Low esteem institutions (Montana State, South Dakota State, Missouri-Kansas City, Montana, North Carolina-Charlotte), there was a significant main effect of argument type, $F(1,244) = 5.40$, $p = .02$, $\eta^2 = .02$. Those in the weak argument condition (M = 2.77, SD = 0.90) rated the esteem of the Low esteem institutions as higher than those in the strong argument condition (M = 2.52, SD = 0.75).

Discussion

The findings seem to support the study hypotheses that strong arguments would result in the participants having more positive attitudes towards junk food taxation than weak arguments. The only significant difference to emerge on the post-manipulation attitudes scales was a main effect of argument strength for Items 1-5 (*negative/positive, harmful/beneficial, foolish/wise, undesirable/desirable, bad/good)*. This finding shows that the manipulation was reliable in presenting an argument that was either persuasive (strong) or not (weak). There more persuasive

the argument, the more likely that there were positive attitudes toward junk food taxation. This finding is consistent with previous research suggesting that strong arguments are more persuasive than weak arguments when individuals are centrally processing the message in those studies (Clark et al., 2008; Lee, 2012). It may be that there was no significant effect of institutional esteem on the post-manipulation attitudes of the participants because they were processing the information centrally, elaborating on the arguments and the presented information. It is possible that manipulating the route of information processing through the introduction of a cognitive load manipulation might alter how accurately participants perceive the argument quality and use the argument to inform their attitudes toward junk food taxation. It is possible that overwhelming participants' cognitive abilities while reading the manipulation will result in greater peripheral processing, in turn leading to a reliance on institutional esteem in the formation of their attitudes.

The finding that participants rated the esteem of the correctly remembered institution as higher in the High esteem group than in the Low esteem group showed that the manipulation of institutional esteem was successful in this study. Although institutional esteem did not affect correct recall of the involved institution, participants who did recall the correct institution accurately perceived the esteem of the institution in a way that is predictable within the operational definition of institutional esteem used in the present study. This finding indicates that the two groups are being perceived as separate and distinguishable on a scale of esteem, lending credibility to the notion that institutional esteem may be used as a heuristic cue when the peripheral route to information processing is taken if participants are not capable of elaboration during processing.

In Study 2, the introduction of the cognitive load manipulation was implemented to assess for the possibility that the name of the institution name may be used as a peripheral cue when reading the argument and forming their attitude toward junk food taxation. I hypothesized individuals that are in the high cognitive load conditions will be more likely to use the name of the institution to form their attitudes Specifically, those in the no cognitive load/strong argument condition will have post-manipulation attitudes towards junk food taxation that are more positive compared to those in the low cognitive load/weak argument condition, and that those in the low cognitive load/weak argument condition will have post-manipulation attitudes towards junk food taxation that are more positive compared to the no cognitive load/weak argument condition; these results should also be independent of institutional esteem. Also, participants in the high cognitive load/weak argument and the high cognitive load/strong argument conditions will have post-manipulation attitudes towards junk food taxation that are more positive when attributed to a high rather than low esteem institution.

Study 2 Method

Participants

Participants were 218 undergraduate students (92 males; 71.6% Caucasian; M_{age} =18.93, SD_{age} =2.91) at a regional campus of a large Midwestern university who received course or extra credit for involvement in the study.

Procedure

All study procedures were approved by the University's Institutional Review Board. Participants first provided informed consent. All measures were completed on a computer. Participants first completed the study-specific measure of attitudes toward ten contemporary

issues (Appendix A), followed by random assignment to one of the study conditions based on the following variables: cognitive load, institutional esteem, and argument.

Participants were prompted that they would be reading an argument in favor of junk food taxation from one of these ten institutions (each participant saw their randomly assigned institution name). The same junk food taxation argument described in Study 1 was utilized in Study 2 (Appendix B). Both argument strength (Strong, Weak) and institutional esteem (High, Low) were manipulated the same way in Study 2 as they were in Study 1. A third manipulation also occurred: cognitive load. While reading the argument in favor of junk food taxation, participants were also asked to: 1) pay attention to a series of letters presented via an audio file and count the number of vowels heard (High); or 2) ignore a series of letters presented via an audio file (Low). In the third manipulation, no auditory information was presented (None). Participants in all conditions wore headphones during the study. Institutional esteem (high, low) and argument strength (strong, weak) were manipulated as in Study 1.

Following the manipulation, those in the high cognitive load condition were asked to specify how many vowels they had heard as a means of assessing whether or not they had followed the instructions to count vowels while reading the argument (Appendix F). Participants in all cognitive load conditions also completed the distraction measure indicating on a scale of 1 (*not at all distracted*) to 7 (*very distracted*) they felt while reading the argument (Appendix F). This was used to assess whether those in the high cognitive load condition were actually more distracted than those in the low cognitive load condition, and if those in the low cognitive load condition were more distracted than those in the no cognitive load condition..

Following the manipulation, participants were asked to rate their attitudes towards junk food taxation (Appendix C). The same ten questions were utilized from Study 1. In addition,

attitude certainty was again assessed with the two items from Study 1 (Appendix C). Participants were also asked to write down up to 10 thoughts that they had while reading the junk food taxation argument (responses not analyzed in the present study).

A study-specific measure of institutional esteem was included (Appendix D). Participants were asked to rate how prestigious they believed the 10 institutions used in the present study were using a scale of 1 (*not at all prestigious*) to 5 (*very prestigious*). Internal consistency was high for the high (α = .85) and low (α = .92) esteemed institutions. This scale was incorporated as a means of checking the manipulation of institutional esteem. It was used to determine whether or not the participants were distinguishing between the esteem of the two groups (High and Low).

A final manipulation check was used to evaluate the memory of the participants (Appendix E). The participants were prompted to write down everything thing that they could remember from the argument for junk food taxation. They were then asked to freely recall the name of the institution from which the argument was said to have come from. Lastly, they were asked to rate the esteem of the institution in the article.

At the end of the study, participants were asked to report basic demographic information. After the study the participants were debriefed and received the study incentive.

Data Analysis

First, data were examined to assess for any participants who did not likely attend to the study manipulation. Any participant for whom open-ended responses (thought listings, argument summary, institution name recall) were not related to the task (for example, blank spaces, random sequences of letters) was culled from further analysis. Five participants were removed from further analysis for this reason. No participants were removed due to significantly fast or

slow study completion times. The remaining analyses were conducted on 213 participants (90 males, 71.9% Caucasian, ages 18-49 [M = 18.95, SD = 2.94]). To assess the study hypotheses, a series of 3 (Cognitive Load: High vs. Low vs. None) × 2 (Institutional Esteem: High vs. Low) × 2 (Argument Strength: Strong vs. Weak) ANOVAs were conducted on the dependent variables.

Results

First, I conducted a 3 × 2 × 2 ANOVA to determine if there were any pre-manipulation group differences in attitude toward junk food taxation. There was not a significant difference in pre-manipulation attitudes based on institutional esteem, $F(1,212) = 0.84$, $p = .36$, argument type, $F(1,212) = 2.25$, $p = .14$, or cognitive load, $F(1,212) = 0.55$, $p = .58$. None of the two-way interactions were significant (ps > .25) and the three-way interaction also showed no group differences, $F(1,212) = 2.18$, $p = .12$.

To assess whether the cognitive load manipulation worked, we examined the distribution of responses (number of vowels heard) in the high cognitive load condition. Two responses were extreme scores (72, 500) in the context of the correct answer (10) and were removed from the calculation of the mean and median. In general responses were clustered around the correct answer (M = 9.36, median = 9.00, mode = 10.00, SD = 4.70). There was a significant main effect of cognitive load on levels of self-reported distraction during the manipulation, $F(2,200) = 71.10$, $p < .001$, $\eta^2 = .42$. The participants in the high cognitive load condition (M = 6.12, SD = 1.43) reported significantly higher distraction than participants in the low cognitive load condition (M = 5.27, SD = 1.45) and in the no cognitive load condition (M = 3.03, SD = 1.82), $ps \leq .001$. Participants in the low cognitive load condition reported higher distraction that participants in the no cognitive load condition, $p < .001$.

Next, a series of 3 × 2 × 2 ANOVAs were conducted to compare the effects of institutional esteem, argument strength, and cognitive load on post-manipulation attitude toward junk food taxation. Of note, the ten post-manipulation attitudes items were again summed into three composite scores based on previous research (Clark et al., 2008) Internal consistency was high for the first five items (α = .98). For the second five items, internal consistency was adequate when Item 6 (*favorable/unfavorable*) was removed from the analysis (α = .69). For the Clark et al. Scale (*negative/positive, harmful/beneficial, foolish/wise, undesirable/desirable, bad/good)*, none of the main effects were significant (*p*s > .41). In addition, none of the two-way or three-way interactions were significant (*p*s > .16).

Lastly, for Junk Food Affect Scale (*unneeded/needed, not valuable/valuable, possible/not possible, not affected/affected*), the main effects of institutional esteem, $F(1,212) = 0.70$, $p = .40$, $\eta^2 = .00$, argument type, $F(1,212) = 0.96$, $p = .33$, $\eta^2 = .01$, and cognitive load, $F(1,212) = 1.30$, $p = .28$, $\eta^2 = .01$, were not significant. The two- and three-way interactions were also not significant (*p*s > .58).

When instead asked how certain they were that their attitude toward junk food taxation was correct, there were no significant main effects of institutional esteem: $F(1,212) = 1.86$, $p = .17$, $\eta^2 = .01$; argument type: $F(1,212) = 0.87$, $p = .35$, $\eta^2 = .004$; or cognitive load: $F(1,212) = 2.36$, $p = .10$, $\eta^2 = .02$. There were also no significant interactions (*p*s > .26). There were similarly no significant differences when participants were asked to rate their certainty in their attitudes toward junk food taxation (*p*s > .26). **Secondary Analyses**

Participants were also asked to freely recall the name of the institution the research summary came from. There was a significant main effect of institutional esteem, $F(1,212) = 11.98$, $p = .001$, $\eta^2 = .06$, indicating participants correctly recalled high esteem institutions (M =

0.55, *SD* = 0.50) more often than low esteem institutions (*M* = 0.32, *SD* = 0.47). However, there was not a significant main effect of argument type, $F(1,212) = 0.05$, $p = .83$, $\eta^2 = .00$, or cognitive load, $F(1,212) = 0.61$, $p = .55$, $\eta^2 = .01$, on correct recall of the institution. The interaction effects were also not significant (*p*s > .41).

Of those who remembered the correct institution, there was a significant main effect of institutional esteem, $F(1,79) = 12.77$, $p < .001$, $\eta^2 = .14$, but not of argument type, $F(1,79) = 1.58$, $p = .21$, $\eta^2 = .02$), or cognitive load, $F(2,79) = 0.72$, $p = .49$, $\eta^2 = .02$, on ratings of the esteem of the remembered institution. Specifically, participants who rated the esteem of the correctly remembered institution as of higher esteem in the High esteem group (*M* = 3.85, *SD* = 1.04) than in the Low esteem group (*M* = 3.21, *SD* = 1.02), $p = .001$.

Several significant interactions also occurred. There was a significant interaction between institutional esteem and argument strength, $F(1,79) = 4.47$, $p = .03$, $\eta^2 = .05$. Specifically, for those who read a strong argument, High esteem institutions (*M* = 4.35, *SD* = 0.80) were rated higher than Low esteem institutions (*M* = 3.18, *SD* = 1.19), $p < .001$. There were no differences in esteem ratings for those who read a weak argument, $p = .29$. There was also an interaction between institutional esteem and cognitive load, $F(2,79) = 4.35$, $p = .02$, $\eta^2 = .10$. Specifically, those in the high cognitive load ($p = .006$) and no cognitive load ($p < .001$) conditions rated High esteem institutions (high: *M* = 4.30, *SD* = 0.82; none: *M* = 4.41, *SD* = 0.87) as higher in esteem than Low esteem institutions (high: *M* = 3.47, *SD* = 0.80; none: *M* = 3.10, *SD* = 1.45). There were no differences in esteem ratings for those in the low cognitive load condition, $p = .79$. There was also a significant interaction between argument strength and cognitive load, $F(2,79) = 3.86$, $p = .03$, $\eta^2 = .09$. Specifically, within the no cognitive load condition, weak argument (*M* = 4.21, *SD* = 1.00) were rated as more esteemed than those that were paired with strong arguments

(M = 3.62, SD = 1.56), p = .005. No differences emerged between those in the high (p = .55) or low (p = .79) conditions. The three-way interaction was marginal, $F(2,79) = 2.73$, p = .07, η^2 = .07.

Discussion

None of the results supported the hypothesis that a cognitive load manipulation would alter how individuals processed information—from centrally to more peripherally—leading to differences in attitudes toward junk food taxation based on the esteem of the institution named in the article and the strength of the argument. The results indicated that cognitive load, when paired with institutional esteem and argument strength, not only had no effect on the formation of an attitude toward junk food taxation, it also had no effect on the confidence of the participants in their reported attitudes. Previous researchers found that taxing the cognitive load of participants leads to a difference in the formation of attitudes; however, the present study failed to replicate such findings (Pohl et al, 2013; Jones et al., 2006). These previous studies used tactics such as restricting the letters that participants could respond with and having them remember a number while preforming a task, and we used a recording of spoken letters that participants had to monitor to count vowels. It is possible that our cognitive load manipulation was not as strong as in the previous studies. Although in the present study our cognitive load manipulation worked—participants rated their level of distraction as highest in the high cognitive load condition, followed by the low and no cognitive load conditions—it had no effect on participants' attitudes towards junk food taxation.

The results of Study 2 indicate that participants were more likely to recall the names of High esteem institutions than Low esteem institutions. It is possible that participants may have been able to remember the institution name because it was a kind of peripheral cue, but perhaps

it was not used in the way that I hypothesized. For example, the peripheral cue of the institutional esteem may not have affected the attitudes of the participants, but perhaps affected how well the participants remember the presented information; being more likely to remember the institution could indicate that they are more likely to remember other points in the argument. Closer analysis of manipulation checks may be needed. Specifically, closer analysis will be needed to look at when participants were prompted to recall everything that they remembered from the argument.

The fact that participants rated institutions in the High esteem group as higher than those in the Low esteem group shows that the institutional esteem manipulation was successful, even with the introduction of the cognitive load manipulation. The finding that participants in the High cognitive load and No cognitive load conditions rated High esteem institutions as higher in esteem than Low esteem institutions shows that institutional esteem is being perceived in both the presence and absence of a secondary cognitive task. Although this pattern of institutional esteem perception was not present in the Low cognitive load condition, it is possible that with more participants a similar pattern would emerge.

The finding that in the absence of a cognitive load manipulation, institutions paired with weak arguments were rated as more esteemed than those paired with strong arguments seems to contradict what was expected. Further research may be necessary to understand why such an interaction may occur.

General Discussion

The present series of studies sought to examine if institutional esteem is utilized as a peripheral cue when judgments are made about the quality of academic research. Specifically, I hypothesized that if an individual was under a high cognitive load, they would be more likely to

use the name of the institution as a peripheral cue when forming their attitude rather than the quality of the argument. The results showed limited support for such a bias in the perception of research quality and the formation of attitudes towards a topic. Institutional esteem did not affect participants' attitude towards the topic in either study. Therefore, the current studies provide limited evidence supporting the idea that the peripheral route of processing, combined with an argument from a high esteem institution, result in more favorable views of research compared to attitudes that are formed under a high cognitive load and an argument paired with a low esteem institution. Although few significant findings emerged across the studies, results in Study 1 (main effect of argument strength on attitude formation; main effect of institution esteem on remembered institution name) and Study 2 (main effect of cognitive load on distraction as a manipulation check; main and interaction effects of institution esteem on remembered institution name) indicated that the manipulations themselves were successful. Thus it is possible that institutional esteem does not work as a peripheral cue, but it is also possible that the dependent variable utilized were not sensitive to its effects.

One finding that did emerge across studies was a difference in institution esteem rating based on exposure to a high or low institution in the study manipulation. This relationship shows that the participants are distinguishing the two groups in a way that divides them on an esteem scale. The fact that the participants are distinguishing between the two groups of institutions lends to the idea that institutional esteem is something that might be used as a peripheral cue. Getting these two finding across the studies suggests the manipulation was successful, but it seemed like this was only the case for those who could accurately recall the institutions. However, future research may be needed to figure how institutional esteem affects the attitudes of individuals whom may use it as a peripheral cue.

Limitations

There are a few possible reasons that that the present results did not show any consistent, significant relationship between cognitive load and attitude formation. It is possible that the cognitive load manipulation did not affect the participants the way that we hypothesized. Although participants reported increased distraction with increased cognitive load, this distraction did not appear to lead to the use of the institutional esteem as a peripheral cue. Perhaps the letter listening task was not enough to distract individuals while they read the argument for junk food taxation. It may also be that institutional esteem is not something that is used as a peripheral cue or heuristic when they are judging the quality of academic research; however, for this conclusion to be reached, additional information is needed. Specifically, we would need to know that the participants were actually processing peripherally in the appropriate conditions. We may have to take a closer look at the memory check that was implemented after the manipulation, and see if there is a pattern in the way that they are remembering and thinking about the information.

It is also possible that the name of the institution was not named in the argument enough. The participants saw the name of the institution in a prompt before the argument, and then again in the argument. It is possible that if the institution was named more times in the argument, then there would have been more participants that remembered the name of the institution.

It may even be possible that the dependent variables used in this study were not sensitive to the effects of institutional esteem as a peripheral cue. Perhaps a peripheral cue like institutional esteem is not an influential factor when an individual is forming an attitude towards a topic like public policy or junk food taxation. Perhaps if the topic were more in line with a subject that is perceived as a more academic or research specific issue (i.e. mental health issues,

medical diagnoses), then an academic research institution would be seen as more of an authority and used as a cue for attitude formation.

It is also possible that there was a fundamental difference between the two populations of the studies. Because the two groups differed significantly in age, it is possible that they have differing opinions on the topic of junk food taxation. The average age of participants in Study 1 was 39.40, indicating that the majority of these individuals are likely to be in the workforce and aware of public policies, as well as the taxes that they are paying. However, the mean age of participants in Study 2 was 18.93. Because these participants were, on average, much younger and still in college, it is possible that the topics of public policies and junk food taxation is not as important to them. It is also possible that educational background (such as completion of a college degree versus college degree still in progress) may have affected understanding and interpretation of the junk food taxation argument. This may explain why the argument strength failed to have an effect in Study 2. However, the finding that individuals are more likely to remember the names of high esteem institutions than low esteemed institutions suggests that there may be a kind of brand recognition effect when it comes to recognizing high esteem institutions. Perhaps they are more recognizable, and they come to mind more readily when individuals think about academic institutions.

Future Research

Future research should look into how familiarity with an institution affects the way that individuals respond to arguments or research that come from familiar institutions. It is possible that mere exposure to an institution may result in higher opinions of the institution. Familiarity may act in a similar way as institutional esteem, especially since one would have to be familiar with an institution to know if it is considered highly esteemed in the first place.

There may also be a relationship between how individuals process information and how they perceive institutional esteem that is opposite of what the present study sought to find. That is, it is possible that by reading a weak argument from a high esteem institution the perceived esteem of the institution may be negatively impacted. Future research should examine if the perceived esteem of an institution affect how individuals process the strength of an argument, and if a cognitive load manipulation plays a role in this relationship.

It is possible that institutional esteem may affect more than perceptions of research quality. It is possible that individuals who have obtained a degree from a more esteemed institution may have a leg-up when it comes to finding a career. Perhaps by controlling for résumé quality, and providing many résumés for participants to look choose someone to "hire," a bias may emerge in favor of those who have degrees from high esteem institutions. Future research may be able to implement résumé studies to assess the possibility of an implicit bias towards job applicants with degrees from highly esteemed institutions.

Given the present results, several changes are suggested for future research on institutional esteem as a peripheral cue. For example, making the argument shorter, with less complex arguments, would allow for the name of the institution to be included more than once. This repetition might increase the saliency of the peripheral cue to form attitudes towards the topic. It is possible that more exposure to the name of the institution would have resulted in more participants remembering the institution correctly. Also, the use a different cognitive load manipulation may have yielded better results. Although participants in the low and high cognitive load conditions reported being more distracted than those in the no cognitive load condition, it is possible that another cognitive load manipulation, perhaps having the participants remember a number or limit the amount of time that they have to read the argument, would have

been more effective in distracting the participants from elaborating on the information that was presented to them.

Conclusions

In conclusion, across two studies I found limited evidence in favor of institutional esteem being utilized as a peripheral cue when reading research-related information. However, this may be due to how attitudes were assessed in the present study. It may be that institutional esteem, as a peripheral cue, did not affect the variables that were measured in the current studies. Future research is needed to gain an understanding of the ways in which individuals use the name of an institution as a peripheral cue to make decisions, process information, remember information, or form attitudes towards a topic.

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Table 1
Study variables presented as Mean (Standard Deviation).

	Study 1			
Variable	S,H	S,L	W,H	W,L
Pre-attitude	4.09(1.04)	4.08 (1.06)	3.75(1.21)	4.06(0.97)
Post-attitude 1-5	7.59(3.21)	7.09 (3.12)	5.77(3.45)	6.58(3.28)
Post-attitude 6	4.63(3.12)	5.12 (3.01)	5.72(2.95)	5.41(3.08)
Post-attitude 7-10	5.52(1.94)	5.18 (2.27)	4.79(2.03)	5.37(1.69)
Post-attitude certainty 1	5.79(1.33)	5.64 (1.63)	5.65(1.39)	5.67(1.23)
Post-attitude certainty 2	5.87(1.33)	5.74 (1.47)	5.70(1.42)	5.91(1.16)
Esteem-high	4.65(0.42)	4.49 (0.77)	4.49(0.60)	4.67(0.47)
Esteem-low	2.49(0.69)	2.56 (0.82)	2.70(0.96)	2.84(0.83)
Distraction	--	--	--	--

Note: S,H = Strong argument, High institution esteem group; S,L = Strong argument, Low institutional esteem group; W,H = Weak argument, High institutional esteem group; W, L = Weak argument, Low institutional esteem group; S,H,N = Strong argument, High institution esteem, No cognitive load group; S,H,L = Strong argument, High institution esteem, Low cognitive load group; S,H,H = Strong argument, High institution esteem, High cognitive load group S,L,N = Strong argument, Low institutional esteem, No cognitive load group; S,L,L = Strong argument, Low institutional esteem, Low cognitive load group; S,L,H = Strong argument, Low institutional esteem, High cognitive load group; Pre-attitude = Measure of pre-manipulation attitudes; Post-attitude 1-5 = Post manipulation measure of attitudes toward junk food taxation (*negative/positive, harmful/beneficial, foolish/wise, undesirable/desirable, bad/good*); Post-attitude 6 = Post manipulation measure of attitudes toward junk food taxation (*favorable/unfavorable*); Post-attitude 7-10 = (*unneeded/needed, not valuable/valuable, impossible/possible, not affected/affected*); Post-attitude certainty 1 = *How certain are you that your attitude is correct?*; Post-attitude certainty 2 = *How certain are you in your attitude towards the new policy?*; Esteem-high = Institutional Esteem Scale (High esteem institutions); Esteem-low = Institutional Esteem Scale (Low Esteem Institutions); Distraction = Measure of Distraction.

Table 1 continued.

	Study 2					
Variable	S,H,N	S,H,L	S,H,H	S,L,N	S,L,L	S,L,H
Pre-attitude	3.73(1.03)	4.20(0.63)	4.14(0.79)	4.13(1.15)	4.29(0.90)	3.73(1.08)
Post-attitude 1-5	7.10(2.81)	7.28(2.50)	7.31(2.77)	7.89(2.08)	8.45(1.83)	7.26(2.38)
Post-attitude 6	5.20(2.91)	4.00(2.62)	4.71(2.74)	4.38(2.25)	4.48(2.27)	5.09(2.62)
Post-attitude 7-10	5.38(1.54)	5.35(1.69)	4.92(1.66)	5.52(1.18)	4.88(1.24)	4.95(1.73)
Post-attitude certainty 1	5.40(1.45)	4.80(1.48)	5.14(1.85)	5.19(2.26)	5.23(1.16)	4.91(1.57)
Post-attitude certainty 2	5.53(1.46)	5.20(1.48)	5.24(1.76)	2.13(1.50)	4.95(1.36)	5.18(1.56)
Esteem-high	4.64(0.42)	4.26(0.85)	4.69(0.30)	4.56(0.50)	4.68(0.38)	4.61(0.35)
Esteem-low	2.85(0.63)	2.50(0.46)	2.72(0.57)	2.81(0.65)	2.76(0.53)	2.71(0.80)
Distraction	2.67(1.54)	4.90(1.45)	6.00(1.64)	3.19(2.07)	5.05(1.80)	6.24(1.14)

Table 1 continued.

	Study 2					
Variable	W,H,N	W,H,L	W,H,H	W,L,N	W,L,L	W,L,H
Pre-attitude	4.50(0.63)	4.41(0.62)	4.14(0.79)	4.24(0.75)	3.89(1.10)	4.17(0.99)
Post-attitude 1-5	8.31(1.93)	7.81(2.14)	6.99(1.99)	7.78(2.13)	7.16(2.80)	7.82(2.11)
Post-attitude 6	3.88(2.36)	4.82(2.40)	5.33(2.20)	4.94(2.59)	5.05(2.61)	4.33(2.17)
Post-attitude 7-10	5.64(1.51)	5.63(1.29)	5.26(1.44)	5.46(1.73)	5.09(1.59)	5.19(1.89)
Post-attitude certainty 1	4.94(1.39)	4.76(1.52)	4.29(1.90)	5.71(1.16)	5.32(1.25)	4.61(1.72)
Post-attitude certainty 2	5.00(1.63)	4.94(1.39)	4.62(1.66)	5.24(1.39)	5.21(1.62)	4.83(1.42)
Esteem-high	4.69(0.26)	4.45(0.40)	4.60(0.33)	4.65(0.67)	4.60(0.33)	4.68(0.35)
Esteem-low	2.55(0.68)	2.82(0.59)	2.55(0.62)	3.07(0.57)	2.73(0.59)	2.99(0.51)
Distraction	3.31(1.70)	5.24(0.97)	5.86(1.53)	2.94(2.01)	5.74(1.37)	6.44(1.04)

Appendix A

Measure of pre-manipulation attitudes

You will now be asked to rate your attitude toward a series of contemporary issues. After rating your attitude toward these issues, you will be asked to read and evaluate an argument for or against one of these issues. Please indicate your personal position on each issue using this scale.

[1] I am completely opposed to this
[2] I am somewhat opposed to this
[3] I am unconcerned with this issue
[4] I am somewhat for this
[5] I am completely for this

1) Junk Food Taxation

2) More gun control

3) More punishment for bullies

4) Gay marriage equality

5) Prayer in schools

6) Immigration rights

7) Birth control

8) Capital punishment

9) Health care reform

10) Legalization of marijuana

Appendix B

Strong argument for junk food taxation

Some states are considering legislation on the taxing of junk food. When taking many factors into consideration, this program seems likely to bring about a number of good things. According to some proponents of this legislation, taxing junk food will provide money for many government-based initiatives. For example, they estimate that a one-cent tax per 12-ounce soft drink could generate about $1.5 billion annually which could be spent on promoting physical activity and nutrition education. In addition, a penny tax per pound of candy would raise about $70 million. Large amounts of money like this could be used to fund a number of healthy lifestyle programs and to subsidize health insurance for people suffering from obesity. Also, most experts predict that these small taxes would have little or no direct effect on sales of these foods. Therefore, employees of junk food producing companies should not be financially affected by this tax legislation. In addition to the economic benefits, placing a tax on junk food will encourage healthy eating. According to Keith Brown, a researcher at Montana State University, a major reason people eat junk food is because it is cheap and convenient. Dr. Brown says that so much cheap junk food creates a "toxic environment" of sweetened food. This junk food is more calorically dense than healthy food, making people who eat it gain weight. Taxing junk food could make people choose healthier alternatives because the healthier food would be significantly cheaper than junk food. Dr. Brown proposes to tax junk food to make unhealthy food more expensive and to use the funds from the tax to decrease the costs of healthy food by 70%. By taking the pressure off of individuals to choose between food quality and food value, people will feel more positive towards buying and eating healthier food. By promoting healthy eating habits, this taxation would also have an indirect impact on the nation's obesity problem (and medical conditions related to obesity). In another study Dr. Brown reports that in 2001, 44.3 million Americans were obese and the number of Americans with diabetes increased 61% since 1990. The same study found that Americans receive nearly one-third of their calories from junk food. These facts are even more alarming when one realizes that diseases like diabetes cost millions of dollars annually in health care and lost productivity. In a 2012 study that assessed the direct costs of treating diabetes in the U.S., other researchers at Montana State found that the estimated total expenditure for 1 year was $45.2 billion. Because eating large amounts of junk food is associated with being obese and is related to a higher risk for costly diseases like diabetes, junk food is a major contributor to the current obesity problem.

Weak argument for junk food taxation

Some states are considering legislation on the taxing of junk food. When taking many factors into consideration, this program seems likely to bring about a number of good things. According to some proponents of this legislation, taxing junk food will provide money for many government-based initiatives. For example, they estimate that a one-cent tax per 12-ounce soft drink could generate a small amount of money annually which could be spent on a number of different things. In addition, a penny tax per pound of candy could create a small increase in funds as well. Amounts of money like this could be used to partially fund programs for a small number of citizens. Also, most experts predict that these small taxes would have a significant effect on sales of these foods. This decrease in sales would have an adverse financial effect on some junk food company employees (approximately 40%-60%). Therefore, most of the money acquired via this tax, would need to be spent toward unemployment funds and other government services for these employees. In addition to the economic benefits, placing a tax on junk food might encourage healthy eating. According to Keith Brown, an undergraduate research assistant at Montana State University, a major reason people eat junk food is because it is cheap and convenient. Brown says that so much cheap junk food creates a "toxic environment" of sweetened food. This junk food is somewhat more calorically dense than healthy food, making people who eat it gain weight. Taxing junk food could make people choose healthier alternatives because the healthier food would be only slightly more expensive than junk food. Brown proposes to tax junk food in order to negatively affect junk food producers and in turn, decrease the large amount of junk food that has become too readily available for consumers. By taking the pressure off of individuals to choose between food quality and food value, people will feel more positive towards buying and eating healthier food. By promoting healthy eating habits, this taxation may also have an indirect impact on the nation's obesity problem (and medical conditions related to obesity). Another study that Keith has assisted in reported that in 2001, 15.3 million Americans were obese and the number of Americans with joint pain increased 2% since 1990. The same study found that Americans receive nearly one-twelfth of their calories from junk food. These facts are even more alarming when one realizes that conditions such as joint pain cost thousands of dollars annually in health care and lost productivity. In a 2012 survey that assessed the indirect costs of treating sufferers of joint pain, other researchers at Montana State found that the estimated total expenditure for 1 year was $100,000. Because eating large amounts of junk food is associated with being obese and is related to a higher risk for costly medical conditions like joint pain, junk food is a major contributor to the current obesity problem.

Appendix C

Post manipulation measure of attitudes toward junk food taxation

1) Junk food taxation is...

   Negative 1 2 3 4 5 6 7 8 9 Positive

2) Junk food taxation is...

   Harmful 1 2 3 4 5 6 7 8 9 Beneficial

3) Junk food taxation is...

   Foolish 1 2 3 4 5 6 7 8 9 Wise

4) Junk food taxation is...

   Undesirable 1 2 3 4 5 6 7 8 9 Desirable

5) Junk food taxation is...

   Bad 1 2 3 4 5 6 7 8 9 Good

6) Please rate how much you favor junk food taxation:

   Favorable 1 2 3 4 5 6 7 8 9 Unfavorable

7) Please rate to what extent you think junk food taxation is needed:

   Unneeded 1 2 3 4 5 6 7 8 9 Needed

8) Please rate to what extent you think junk food taxation would be valuable:

   Not valuable 1 2 3 4 5 6 7 8 9 Valuable

9) Please rate to what extent you think junk food taxation is possible:

   Impossible 1 2 3 4 5 6 7 8 9 Possible

10) To what degree will the plan (to tax junk food) affect you personally?

   Not affected 1 2 3 4 5 6 7 8 9 Affected

How certain are you that your attitude is correct?

Not at all certain	1	2	3	4	5	6	7	Very certain

How certain are you in your attitude towards the new policy?

Not at all certain	1	2	3	4	5	6	7	Very certain

Appendix D

Institutional esteem scale

Using the scales provided, please indicate how prestigious you believe each of the following universities to be.

[1] Not at all prestigious
[2] Not very prestigious
[3] Average
[4] Somewhat prestigious
[5] Very prestigious

1) Columbia University

2) Harvard University

3) Montana State University

4) Princeton University

5) South Dakota State University

6) Stanford University

7) The University of Missouri at Kansas City

8) The University of Montana

9) The University of North Carolina at Charlotte

10) Yale University

Appendix E

Manipulation check questions

Please write down everything you remember from the passage you read regarding the proposed junk food taxation policy:

The research that was discussed in the passage you read came from what University?

How would you rate the esteem of the University that the research came from in the passage?

1	2	3	4	5
Low esteem				High esteem

Appendix F

Measure of distraction

How many vowels did you count?

How distracted did you feel while reading the passage?
Not at all distracted 1 2 3 4 5 6 7 Very distracted